

REMARKS

Claim 54 is amended, no claims are canceled, and no claims are added; as a result, claims 1, 3-13, 15-17, 23-30, 48-54, and 57-58 remain pending in this application.

In the Office Action Summary, checkbox 4 recites, "[c]laim(s) 1,3-13,15-17,23-30,48-54 and 57 is/are pending in the application." Applicant submits that this statement is incorrect. Claim 58 is still pending in the application, but is not included in the list recited after checkbox 4. However, claim 58 is included in the list of claims rejected on page 2 of the Office Action under 35 U.S.C. § 102(e). Applicant submits that claim 58 is still pending in the application. Applicant has proceeded under the assumption that this is merely a typographical error, that claim 58 is still pending in the application, and that the Examiner intended to include the rejection of claim 58 as stated on page 2 of the Office Action. Applicant respectfully requests clarification/correction of the Office Action Summary. Further, if any of the above mentioned assumptions are incorrect, Applicant reserves the right to response to any clarification/correction provided, and to provide additional arguments in response to and based upon any clarification/correction provided.

Further, checkbox 6 recites, "[c]laim(s) 1,3-13,15-17,23-30,48-54 and 57 is/are rejected." Applicant submits that this statement is incorrect. As noted above, claim 58 is still pending in the application, and further, claim 58 is included in a rejection on page 2 of the Office Action. Further, checkbox 6 does not list claims 14, 55, 56, 59, and 60 as being rejected, yet on page 5 the Office Action rejects claims 14, 55, 56, 59, and 60 under 35 U.S.C. § 103(a). Applicant submits that claims 14, 55, 56, 59, and 60 were previously canceled from the application. The rejection of claims 14, 55, 56, 59 and 60 is addressed in a later section of this response. However, Applicant respectfully requests clarification/correction of the Office Action Summary.

§102 Rejection of the Claims

Claims 1, 3-8, 11, 15-17, 23-30, 48-54, and 57-58 were rejected under 35 U.S.C. § 102(e) as being anticipated by Huang *et al.* (U.S. Patent No. 6,069,066). Applicant respectfully traverses the rejection of claims 1, 3-8, 11, 15-17, 23-30, 48-53, and 57-58.

Applicable Law

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, [a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). (emphasis added). The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP ' 2131.

Although this disclosure requirement presupposes the knowledge of one skilled in the art of the claimed invention, that presumed knowledge does not grant a license to read into the prior art reference teachings that are not there." *Motorola, Inc. v. Interdigital Tech. Corp.*, 43 USPQ2d 1481, 1490 (Fed. Cir. 1997).

To serve as an anticipation when a reference is silent about the asserted inherent characteristic, the gap in the reference may be filled with recourse to extrinsic evidence. But, such evidence must make clear that "the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. v. Monsanto Co.*, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

Independent claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57

Claims 1, 4, and 7, in referring to a trench, recite, "the depth being greater than a critical depth." Claim 8 recites, "a trench having a trench depth greater than a critical depth." Claims 11, 15, 23, 26, 48, 52, and 57, in referring to a trench recite, "a depth greater than a critical depth."

In contrast, Huang *et al.*, in the abstract, teaches, "An inter-metal dielectric layer with a trench is formed on the multi-metal layer." Hence, Huang *et al.* fails to teach a trench having "a critical depth" as recited in claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57. In addition,

Applicant's representative has reviewed Huang *et al.* and fails to find the word "critical" in Huang *et al.* The Office Action, in paragraph 1, states, "Huang (Fig 2A-F) discloses . . . a trench having a depth and a width, the depth being greater than a critical depth (via sum of bottom layers)." The Office Action does not cite to a column or line in Huang *et al.* that teaches "a trench having a depth and a width, the depth being greater than a critical depth (via sum of bottom layers)." Hence, Huang *et al.* fails to teach each of the elements of claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57. Thus, the Office Action fails to state a *prima facie* case of anticipation with respect to claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57.

The Office Action admits on pages 6-7 that there is no express recitation of a critical depth in the prior art. Applicant agrees. Further, the Office Action fails to provide evidence that makes clear that "the missing descriptive matter is *necessarily present* in the thing described in the reference, and *that it would be so recognized by persons of ordinary skill.*" (emphasis added) Instead, on pages 6-7 the Office Action states the following:

While examiner concurs there is no express recitation of the phrase 'critical depth,' the lack of such phrase does not preclude such a disclosure as indicated by examiner in the office action supra. Likewise, it is known that applicant's can be there [sic] own lexicographers, so changes in terms/names do not impart patentability in a device claim, when the reference meets the structural definition. Furthermore, besides mere conjecture applicant has failed to indicate why the prior art does not meet the limitation of a trench with a critical depth. Absent extrinsic evidence, applicant's arguments are deemed moot. Moreover, the fact that applicant may have recognized another advantage [i.e. alleged 'critical depth'] which would flow naturally from the suggestion of prior art cannot be the basis for patentability when the differences would otherwise be obvious. (emphasis added)

Applicant disagrees with these statements. Further, these statements do not comport with the Examiner's burden to state a *prima facie* case of anticipation according to the applicable law. It is not the *requirement* of the Applicant to indicate why the prior art does not recite each of the limitations recited in the claims, or to produce extrinsic evidence of any kind to show that an element exists in the prior art. Because the Office Action fails show the presence, in a single prior reference, a teaching of each and every element of claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57, as arranged as in these claims, the Office Action fails to state a *prima facie* case of anticipation with respect to 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57.

For at least the reasons stated above, Applicant respectfully requests withdrawal of the rejection and reconsideration and allowance of claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57.

Claim 3 is dependent on claim 1. Claims 5 and 6 are dependent on claim 4. Claims 16 and 17 are dependent on claim 15. Claims 24 and 25 are dependent on claim 23. Claims 27, 28, 29, and 30 are dependent on claim 26. Claims 49, 50, and 51 are dependent on claim 48. Claim 53 is dependent on claim 52. For reasons analogous to those stated above and elements in the claims, Applicant respectfully submits that the Office Action fails to state a *prima facie* case of anticipation with respect to claims 3, 5, 6, 16, 17, 24, 25, 27, 28, 29, 30, 49, 50, 51, and 53.

For at least the reasons stated above, Applicant respectfully requests withdrawal of the rejection and reconsideration and allowance of claims 3, 5, 6, 16, 17, 24, 25, 27, 28, 29, 30, 49, 50, 51, and 53.

Independent claims 54 and 58

Independent claim 54, as amended, recites,

a trench having a width, a depth, and a metal layer; and
a second trench having a width, a depth and a plurality of metal layers, the
width of the second trench is greater than the width of the trench, and at
least one of the plurality of the metal layers is electrically coupled to the
metal layer.

(emphasis added)

Independent claim 58 recites,

a trench having a width less than a critical width, a depth and a metal
layer; and
a wide depression having a second width greater than the critical width, a
second depth equal to the depth, and a plurality of metal layers, wherein at
least one of the plurality of metal layers is coupled to the metal layer.

(emphasis added)

In contrast, Huang *et al.* at column 2, lines 56-62 states,

In FIG. 2D, a part of the second metal layer 212 and a part of the first metal layer 210 are removed until the inter-metal dielectric layer 202 is

exposed, for example, by chemical-mechanical polishing (CMP).

In FIG. 2E, a cap layer 214, such as a silicon nitride layer or a silicon-oxy-nitride layer is formed on the inter-metal dielectric layer 202.

However, there is no teaching in Huang *et al.* of a coupling of a metal layer in a trench with at least one of a plurality of metal layers in either a second trench as recited in claim 54, or a wide depression as recited in claim 58. Thus, Huang *et al.* fails to teach each of the elements recited in claims 54 and 58, and so the Office Action fails to state a *prima facie* case of anticipation with respect to claims 54 and 58.

For at least the reasons stated above, Applicant respectfully requests withdrawal of the rejection and reconsideration and allowance of claims 54 and 58.

§103 Rejection of the Claims

Claims 14, 55, 56, 59, and 60

Claims 14, 55, 56, 59, and 60 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang *et al.* (U.S. Patent No. 6,069,066) in combination with Lin *et al.* (U.S. Patent No. 6,551,916). Claims 14, 55, 56, 59, and 60 were previously canceled, so the rejection is moot.

Applicable Law

The Office Action must provide specific, objective evidence of record for a finding of a teaching, suggestion or motivation to combine reference teachings and must explain the reasoning by which the evidence is deemed to support such a finding. *In re Sang Su Lee*, 277 F.3d 1338 (Fed. Cir. 2002).

Claims 9, 10, 12, and 13

Claims 9, 10, 12, and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang *et al.* (U.S. Patent No. 6,069,066) in combination with Ooishi (U.S. Patent No. 6,208,547). Applicant respectfully traverses the rejection of claims 9, 10, 12, and 13.

The Office Action, in an attempt to meet the requirements of *In re Sang Su Lee*, on page 6 states, "It would have been obvious to one of ordinary skill in the art to incorporate the contact structure of Huang with the logic/memory interconnect structure of Ooshi [sic] in order to

provide a contact structure as required by Ooishi (36006 and n1200) and that is free form oxide as taught by Huang (Col. 1, Lines 66-67)." However, these statements are not supported by the record. Ooishi at column 11, lines 8-13 recites,

FIG. 13 illustrates the sectional structure of the memory core 1000 shown in FIG. 12 connected with the logic core 3000 on a flip chip.

A pad 3006 of the logic core 3000 and the pad 1202 of the memory core 1000 are connected with each other through the solder bump 1201.

Thus, Ooishi is concerned with connections between pads using solder bumps, and thus teaches away from the contact structure of Huang *et al.* Further, the Office Action fails to point to any indication that Ooishi is concerned with "oxide" as suggested in the Office Action. Thus, the arguments made for the proposed combination of Huang *et al.* with Ooishi are not found in the cited documents. Thus, the Office Action fails to meet the standard established by *In re Sang Su Lee* for provide specific, objective evidence of record for a finding of a teaching, suggestion, or motivation to combine the reference teachings. Therefore, the Office Action fails to state a *prima facie* case of obviousness with respect to claims 9, 10, 12, and 13.

In addition, the Office Action still fails to state a *prima facie* case of obviousness even if the proposed combination of Huang *et al.* and Ooishi were made because the proposed combination fails to teach or suggest each of the elements of claims 9, 10, 12, and 13.

Claim 10 recites, "a trench having a trench depth greater than a critical depth." Claim 9 is dependent on claim 8. Claims 12 and 13 are dependent on claim 11. Claims 8 and 11 recite a trench having a depth greater than "a critical depth." For reasons analogous to those argued above with regards to claims 1, 4, 7, 8, 11, 15, 23, 26, 48, 52, and 57, Huang *et al.* fails to teach or suggest these elements as recited in claims 9, 10, 12, and 13. Further, Applicant can not find in, and the Office Action does not rely on, Ooishi as supplying these elements missing in Huang *et al.* Thus, neither Huang *et al.* nor Ooishi, either alone or in combination, teach or suggest all of the elements of claims 9, 10, 12, and 13. Thus, the Office Action fails to state a *prima facie* case of obviousness with respect to claims 9, 10, 12, and 13.

For at least the reasons stated above, Applicant respectfully requests withdrawal of the rejection and reconsideration and allowance of claims 9, 10, 12, and 13.

Reservation of Rights

Applicant does not admit that references cited under 35 U.S.C. §§ 102(a), 102(e), 103/102(a), or 103/102(e) are prior art, and reserves the right to swear behind them at a later date. Arguments presented to distinguish such references should not be construed as admissions that the references are prior art.

Statement Concerning Copending Application

Applicant informs the examiner of a copending application, namely, U.S. Serial No. 10/931,357, a divisional of the present application, and now published as 2005/0074966A1.

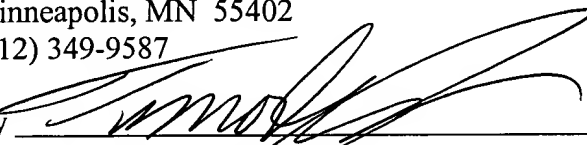
CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,
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Date 23 June '05

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 23 day of June, 2005.

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